Amendments to the Specification:

Please replace paragraph [0006] with the following amended paragraph:

[0006] That is to say, this thermal sensing is based on the fact that the thermal conductance between the heater platform and the storage substrate changes according to the distance between them. The medium between a cantilever and the storage substrate, in this case air, transports heat from one side of the heater/cantilever to the ~~other of~~ storage media/substrate. When the distance between heater and media is reduced as the probe moves into a bit indentation, heat is more efficiently transported through the air, and the heater's temperature (and hence its resistance) decreases. Thus, changes in temperature of the continuously heated resistor are monitored while the cantilever is scanned over data bits, providing a means of detecting the bits.

Please replace paragraph [0007] with the following amended paragraph:

[0007] Under typical operating conditions, the sensitivity of the thermomechanical sensing is even better than that of piezoresistive-strain sensing inasmuch as thermal effects in semiconductors are stronger than strain effects. A $\Delta R/R$ sensitivity of about 10^{-4}/nm is demonstrated by the images of the 40-nm-size bit indentations. This is better than the results ~~are~~ obtained using the piezoresistive-strain technique.

Please replace paragraph [0011] with the following amended paragraph:

[0011] Fig. 3 is a schematic probe-side plan view of the cantilever showing a heater/FET arrangement according to a first embodiment of the invention.

Please replace paragraph [0012] with the following amended paragraph:

[0012] Fig. 4 is a schematic underside plan view of the cantilever showing a heater/FET arrangement according to a second embodiment of the invention.

Please replace paragraph [0013] with the following amended paragraph:

[0013] Fig. 5 is a schematic underside plan view of the cantilever showing a heater/FET arrangement according to a third embodiment of the invention.

Please replace paragraph [0015] with the following amended paragraph:

[0015] Fig. 7 is a circuit diagram showing the basic connection between the heater and the FET which is used in the embodiments of the invention.

Please replace paragraph [0016] with the following amended paragraph:

[0016] Fig. 8 is a schematic top plan view of a cantilever according to a fifth embodiment of the invention.

Please replace paragraph [0017] with the following amended paragraph:

[0017] Fig. 9 is a circuit diagram showing how the heater element is serially connected with the FET in the arrangement depicted in Fig. 8.

Please replace paragraph [0024] with the following amended paragraph:

[0024] The probe 104 is formed on the end bridge member 100C. The probe 104 is formed using suitable masking and etching, or ~~the~~ a like type of fabrication technique, ~~can be formed~~ so as to be at least in part electrically non-conductive.

Please replace paragraph [0036] with the following amended paragraph:

[0036] The FET 114 is formed only ~~long~~ along the lower portions of the cantilever 100 and is formed only in the portions of the cantilever 100 that actually move in response to the probe encountering a topographical change. The formation of the FET

114 on the lower surface of the cantilever facilitates production, provides a greater W/L ratio, and a greater sensor area and gain. The formation of the FET 114 on portions of the cantilever which do not undergo much movement ~~are~~ is avoided to avoid contribution to DC current and noise.

Please replace paragraph [0038] with the following amended paragraph:

[0038] During the read mode of operation, trace 114A, which extends continuously along both legs 100A, 100B and across the end bridge 100C, acts as a common drain while traces 114B and 114D act as sources for what is essentially two halves of the FET. Features 114C, ~~is~~ in this embodiment, form channels which separate the drains and sources of the FET arrangement.

Please replace paragraph [0040] with the following amended paragraph:

[0040] During the heating/write mode of operation, the bias to the substrate 110 is lowered to the point where gating of the FET does not occur. At this time the roles of traces 114B and 114D are changed so that one acts as the positive terminal for the heater 116 while the other acts as the negative terminal. Electrical current is therefore induced to ~~passed~~ pass through the heater 116.

Please replace paragraph [0043] with the following amended paragraph:

[0043] As shown in Figs. 2A and 2B the medium 108 and the cantilever 100 are operatively (mechanically) interconnected so that medium 108 is selectively movable with respect to the cantilever 100 by way of a drive mechanism denoted by element 118 (schematically depicted in Fig. 2). This mechanism is arranged to move the two elements (viz., the cantilever 100 and the medium 108) with respect to one another so as to assume a selected coordinate relationship and position the probe 104 so that it can detect if a data indicative of a change in topography (e.g. a pit 108A) is present or absent at that set of coordinates.

Please replace paragraph [0045] with the following amended paragraph:

[0045] Since the FET is capable of producing gain, the sensing aspect of the embodiments can be expected to ~~produces~~ produce a relatively large output signal with respect to the various noise sources and thus reduce signal degradation due to these noises.

Please replace paragraph [0046] with the following amended paragraph:

[0046] While the embodiment of Fig. 3 has been disclosed as ~~being~~ including a depletion mode FET, it is possible, in this and the other embodiments of the invention, to use an induced-channel type FET. This induced-channel or enhancement mode FET is such that there is no intrinsic channel and the drain to source conductance is very low until the gate voltage is applied. When the gate voltage exceeds a given threshold, enough carriers are pulled into the channel region that the device starts to conduct. In an N-channel enhancement type FET, the channel is p-type material that forms a conduction band when sufficiently positive gate voltage is applied. When conducting, the channel behaves like n-type material.

Please replace paragraph [0050] with the following amended paragraph:

[0050] The switching between the reading and writing mode is achieved ~~one~~ by operating the source and drain at voltages such that the FET was turned on partially. This places the channel in a state of medium conductivity where there would be a lot of voltage drop across it. Assuming that the substrate potential was fixed, the source voltage could be set to a value to establish the "on resistance" of the FET and the drain could be set to a voltage to cause the desired amount of power to be dissipated.

Please replace paragraph [0052] with the following amended paragraph:

[0052] Fig. 6 shows a fourth embodiment of the invention. In this embodiment the cantilever 400 includes two bridge portions 400C and 400D. The second bridge portion 400D is formed inboard of the end bridge on which the probe and heater are formed. The FET 414 is formed on the second bridge and thus isolated from the heater 416. The FET 414 is formed so as to have interdigitized drain and source portions 414A, 414B with channels 414C interposed therebetween in the illustrated manner. This ~~interdigitzing~~ interdigitizing or interlacing of the FET source and drain structures provides a higher W/L ratio and thus improves performance. This embodiment of course requires the structure of the cantilever to be modified. However, this modification is readily achieved using conventional etching techniques and as such no further disclosure of this is deemed necessary.

Please replace paragraph [0054] with the following amended paragraph:

[0054] Conversely, during the sensing phase, the bias to the substrate 110 is elevated to a level wherein the FET can be gated and thus rendered conductive (thus exhibiting a resistance of 1000Ω for example). During this time, the high resistance of the heater (e.g. about 3500Ω) effectively directs a majority of the current flow through the FET 414 and the temperature of the heater falls to essentially ambient levels.

Please replace paragraph [0055] with the following amended paragraph:

[0055] Fig. 8 shows a fifth embodiment of the invention. This arrangement is arranged so that the channel 514C of the FET 514 is asymmetrically formed at an angle between the source and drain 514B, 514A and such that it is arranged to one side of, and in series ~~with.~~ with the heater 516.

Please replace paragraph [0068] with the following amended paragraph:

[0068] Fig. 14 shows a seventh embodiment of the invention. This arrangement is similar in layout to that of the sixth embodiment and differs in that the

heater 704 is provided with separate positive and negative traces or terminals 714P and 714N. This allows the signal from the FET 714 to be fed ~~though~~ through traces which are electrically separated from those which define the heater circuit.